



Demonstration of food processing equipment

Problem Statement

- Need for development of food preparation workspace for long-term human missions that incorporates containment and treatment of food preparation emissions.
- Hypogravity affects transport of fluids, vapors and particles. Characterization of particle transport from food preparation activities will support system maturation.
- Technology uses: space habitats for human missions, galleys in confined spaces (e.g. submarines).

Technology Development Team

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- NASA JSC (SBIR Phase II)
- Makel Engineering (prime) and Cornell University (sub)

Proposed Flight Experiment

Experiment Readiness:

- Last quarter of 2013.

Test Vehicles:

- Parabolic aircraft.

Test Environment:

- Payload has not flown before.
- Requested environment for tests: Moon and Mars gravity.

Test Apparatus Description:

- Payload is a fume hood for food preparation. Tests will consist of evaluating the oil spatter due to sautéing two types (TBD) or shelf-stable foods under the physical constraints of the hood, with and without forced ventilation, at the gravity levels stated above.
- The user interfaces are sample dispensers, cooktop controls, fan controls, and data acquisition system (via laptop).



Technology Maturation

- TRL 5 criteria – test current prototype in reduced gravity
- TRL 6 criteria – test high fidelity prototype (all components integrated) in reduced gravity
- Maturation steps: ground tests of integrated components (Fe-May 2013), parabolic flight tests (May-Sep 2013), parabolic flight test (Oct-Dec 2013). Beyond Phase II – high fidelity prototype
- No current deadlines to TRL 6 and higher

Objective of Proposed Experiment

- Objective: collect spatter pattern data for sautéing under hypogravity and constraints of hood environment.
- Flight data: spatter patterns and environmental conditions for each experiment. Data will be used to validate/improve the design of the hood's emissions capture and treatment system (e.g., internal layout, fan flow rates, filtering, etc)